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APPLICATION FOR UNITED STATES LETTERS PATENT

# MACHINE ASSISTED SYSTEM FOR PROCESSING AND RESPONDING TO REQUESTS

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# MACHINE ASSISTED SYSTEM FOR PROCESSING AND RESPONDING TO REQUESTS

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This application is a continuation of U.S. Application Serial No.: 09/378,515, filed August 20, 1999, which is incorporated herein in its entirety by reference.

## BACKGROUND AND SUMMARY OF THE INVENTION

Many businesses, such as credit card companies, receive frequent requests for information of a type which requires a person's response to certain questions. The ability to provide this service via a telephone, the internet, or other various means is highly desirable. As the information requested becomes more complicated and the cost of person call handling greater, it is important to facilitate data input and enterprise wide data sharing of all data, including data newly created at and during the time of a call before the call is sent to persons. While fully automated self-service is often a goal, the complexity of many service offerings and the patience and skill of customers in providing self-service, typically result in many calls being unable to be fully automated. Therefore, when a call that begins as an automated call is routed to a person, it offers a great benefit if all data already provided by the caller is instantly also available to the person. By eliminating the need to repeat or re-enter data, including data provided just a few moments ago as well as the results of any manipulations of this data separately or in combination with other data such as real-time credit scoring or credit offer construction, the call is shorter and less costly and the caller is provided superior service. Also, the request can be routed more appropriately to a qualified person, by being able to access all data entered by the caller.



tones from the caller responding by pushing buttons on the telephone touchpad. All information provided by the caller is captured and transformed preferably electronically (but may also be by manual entry via a computer keyboard into a computer system), from the initial input signal to a form that is usable in responding to the request. The information entered by the caller may be used for retrieving additional information from a preexisting database, constructed during the caller's past use of the system and/or constructed from prior data entry from other means, such as a live operator's manual entry of data.

Once the caller answers some or all of the questions, the request may be transferred to a person or a computer, either of which is able to access and use all of the information entered by the caller and retrieved from the database in order to formulate a response. If the caller terminates use of the system, the caller responses already entered may be retained in the database for future use. If it is required that the request be transferred to a second, or additional person or computer, or back and forth between persons and computers, the information entered by the caller and retrieved from the database will be accessible and usable in responding.

The system of the present invention is not limited to requests made by telephone. Requests may be submitted by sound, speech, electronic text, email, fax, internet, or any input from a human, machine, telephone, or computer that is processed by making use of a voice or data network or a device embedded in or attached to a network. As such, a caller may also respond to questions posed by the system in ways not involving the telephone. For example, a caller may make an entry into a computer-based application, or utilize another type of signaling device such as a tone generator.

The system of the present invention eliminates the redundant entering of information each time a caller accesses the system or moves from point to point in the system. By

recognizing the caller, and retrieving relevant information, including, for example, any and all responses entered via the IVR, even those responses entered during prior calls abandoned by the caller, (that may be in , a preexisting database), a minimum amount of new information is required from the caller before a response can be generated. Thus, an accurate response can be provided to a caller in much less time. Additionally, because a significant amount of information about a caller may be maintained in a database, the system may also include the ability to process requests that require conclusions about the caller. For example, the system may further include the ability to obtain information from outside sources such as various credit bureaus, and to use this information in conjunction with the information retrieved from the database to perform the calculations necessary for the approval or denial of loans or credit card applications or dynamically created terms of an offer. The system in this manner becomes a vehicle for negotiations of transactions. Instead of merely accomplishing static data collection from caller responses, the present invention provides a system for dynamic negotiations to conclude a transaction while the system is live with the caller. By creating a packet of information in a computerized record, the caller's information (entered during the call, collected from a database during the call, or collected from an outside source during the call) can travel with the call and be immediately accessible to all users of the system to respond to the caller's request.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a portion of the preferred embodiment of the present invention, wherein the system is configured to respond to requests for information;

Figure 2 depicts an alternate embodiment of the present invention, wherein the system of Figure 1 is further provided to communicate with secondary information sources, such as credit bureaus; and,

Figure 3 shows a schematic representation of a preferred embodiment of the system of the present invention in which a unit of work information packet is created and travels with a call.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

A portion of the preferred embodiment of the system **1** of the present invention can be seen in Figure 1. A caller request which may come through the public switched telephone network **2** is made to the system **1** via telephone, fax, internet, or various other means. An ACD **4** answers the request and transfers it to an IVR **6**. The IVR **6** is able to identify the caller by responses the caller provides and/or by ANI (automatic number identification) verification known to those of ordinary skill in the art. The IVR **6** asks the caller questions and processes the caller's responses, until the caller answers all of the required questions, terminates the request, or requests to speak to a person. The responses to the questions asked by the IVR may be entered by any of various means, depending on the device used to make the request. For example, sound, speech, electronic text, email, fax, internet, or any input from a human, machine, telephone, or computer that is processed by making use of a voice or data network or a device embedded in or attached to a network may be used to respond to the IVR. The IVR **6** preferably has natural language voice recognition, such that it is able to respond to human speech. Once the required information is obtained from the caller, the IVR **6** routes the request to a server **10** coupled to a routing switch **8**. Depending on the request made by the caller, additional information may be needed to formulate a response.

The routing switch **8** is also coupled to a database server **12**, which is controlled by a contact management system **14**. The database server **12** contains information on the callers who use the system **1**. Each time that a caller uses the system **1**, any relevant information about the caller is stored in a database **16** within the database server **12**. The next time that the caller uses the system **1**, in a preferred embodiment of the present invention the collected information in the

database **16** will be available for use along with the additional information obtained by the IVR in order to generate a response to the request.

The routing switch **8** may also be in communication with a hub **18** for distribution of the information. The hub **18** may be connected to any number of workstations **20** or other devices for displaying the information or for formulating a response. For example, if a caller wishes to speak to a person, any information that the caller has input to the system **1** during the call as well as any relevant information from the database **16** will be transferred to the person responding to the request. Each time the caller is transferred to another person, or between persons and computers, the relevant information may be transferred also.

Figure 2 is preferably identical to the embodiment of Figure 1, with the added ability to communicate with at least one external, secondary information source. As in the above description, a request is sent to the system. The process for responding to the request follows the same steps as described for Figure 1. For a complex request, such as, for example, a credit card application, additional information not available from the caller or from the database **16** may be required. In such a case, the system **1** may be provided with the ability to retrieve the information from another source.

As can be seen in the embodiment shown in Figure 2, the system is designed to communicate with one or more outside sources, such as credit bureaus **30**. A signal from the routing switch **8** preferably passes through a firewall **22** and into a router **24**. The signal may then pass through a DSU/CSU **26** before reaching the credit bureaus **30**. Various information about a caller, such as credit history **34** and credit scoring **32**, may be obtained from the credit bureaus **30**. The system **1** may then use the data from the credit bureaus **30** in conjunction with the information it already possesses to calculate a proper response to the request. Having the



ability to access this additional information allows the system 1 to provide actual calculated responses. Without this ability, the system 1 would only be able to provide a generic response based on the information it currently had available, and the caller would have to wait until the necessary additional information was obtained. In such a case, an automated or instantaneous response would be impossible, as a person would likely have to obtain the additional information necessary to reach a conclusion.

The present invention allows a business or other entity to respond to requests for information in a more timely and efficient manner, and to make automated responses to requests that previously required human interaction. By capturing all of the information input by a caller and storing the relevant information in a database, the amount of data and time required to respond to a request can be minimized. Additionally, by providing the system with the ability to obtain information from outside sources, more complex requests can be handled by the system. Now instead of merely collecting data about a caller for later action, the present invention collects caller data, compares the data to other existing data, dynamically decides which questions to ask the caller based on the data provided by the caller and in view of the data accessed at an additional source, and provides the caller with a resolution during the call. This resolution may be, by example, a decision to increase the caller's credit line on a credit card.

Figure 3 shows another preferred embodiment of the present invention in which an unit of work (UOW) information packet is created for each call. The UOW includes the information collected from the caller by the IVR and may also include the relevant information pulled from an existing database during the call. If an outside source, such as a credit bureau is contacted during the call then the UOW may include this information also. The UOW is a unique record of the call and may be created in the centralized DBASE of the system. Data collected from these

sources is written in real time to the UOW during the call. If the call is transferred to a live agent, the UOW goes with the call and the live agent thereby has access to all the information in the UOW. This is important because if the live agent has access to the answers the caller has provided before, then there is no need to repeat questions to the caller. The live agent can learn the caller's relevant information already collected and proceed to help the caller without unnecessary delay. The live agent may append data to the UOW that the live agent enters through his or her terminal keyboard as the live agent speaks with the caller. If the caller needs further assistance from another agent such as a supervisor, the call UOW may be transferred to the second agent for further handling and the entire data collected on the caller will be immediately available to the second agent via the UOW.

Preferably, the system of the present invention is constructed to enable the UOW to be created automatically for each call at the time the call is received, via software running at a computer in the system and in electronic communication with the IVR and other system hardware. The software may be activated by the IVR or at a switch in a long distance carrier, or by a CTI server, upon answering the call and may use an electronic date-time stamp or unique identifier to start a unique call record. Caller responses and database information may be stored in the UOW automatically by electronic data transmission through the IVR.

The scope of the invention is not to be considered limited by the above disclosure, and modifications are possible without departing from the spirit of the invention as evidenced by the following claims.